Complete Summary

GUIDELINE TITLE

Intrapartum fetal heart rate monitoring: nomenclature, interpretation, and general management principles.

BIBLIOGRAPHIC SOURCE(S)

American College of Obstetricians and Gynecologists (ACOG). Intrapartum fetal heart rate monitoring: nomenclature, interpretation, and general management principles. Washington (DC): American College of Obstetricians and Gynecologists (ACOG); 2009 Jul. 11 p. (ACOG practice bulletin; no. 106). [49 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: American College of Obstetricians and Gynecologists (ACOG). Intrapartum fetal heart rate monitoring. Washington (DC): American College of Obstetricians and Gynecologists (ACOG); 2005 Dec. 9 p. (ACOG practice bulletin; no. 70). [43 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

- Labor and delivery
- Conditions associated with risk of fetal death or injury, including:
  - Maternal hypertensive disease or type 1 diabetes
  - Fetal growth restriction
  - Preterm labor

GUIDELINE CATEGORY

Assessment of Therapeutic Effectiveness
Counseling
Evaluation
Management

CLINICAL SPECIALTY

Family Practice
Obstetrics and Gynecology
Pediatrics

INTENDED USERS

Advanced Practice Nurses
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To aid practitioners in making decisions about appropriate obstetric and gynecologic care
- To review nomenclature for fetal heart rate (FHR) assessment, review the data on the efficacy of electronic fetal monitoring (EFM), delineate the strengths and shortcomings of EFM, and describe a system for EFM classification

TARGET POPULATION

Fetuses at risk for oxygen deprivation because of antepartum complications, suboptimal uterine perfusion, placental dysfunction, and other intrapartum events that can result in adverse neonatal outcome

INTERVENTIONS AND PRACTICES CONSIDERED

1. Electronic fetal heart monitoring and frequency of tracing reviews
2. Intermittent auscultation of fetal heart sounds
3. Assessment of maternal medications
4. Evaluation and treatment of persistently nonreassuring fetal heart rate tracings
5. Intrapartum fetal stimulation (fetal scalp sampling, Allis clamp scalp stimulation, vibroacoustic stimulation, and digital scalp stimulation)
6. Fetal pulse oximetry (not recommended)
7. Intrauterine resuscitation (e.g., maternal oxygenation, tocolytic therapy, beta-2-adrenergic agents, amnioinfusion, volume expansion or intravenous ephedrine for maternal hypotension secondary to anesthesia)

MAJOR OUTCOMES CONSIDERED

- Rate of intrapartum complications, including neonatal seizures, cerebral palsy, and intrapartum fetal death
- Rate of unnecessary obstetric intervention, including operative vaginal or cesarean delivery
- Rate of perinatal mortality
- False-positive rate of electronic fetal monitoring
- Intraobserver/interobserver variability

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The MEDLINE database, the Cochrane Library, and the American College of Obstetricians and Gynecologists' (ACOG) own internal resources and documents were used to conduct a literature search to locate relevant articles published between January 1985 and January 2009. The search was restricted to articles published in the English language. Priority was given to articles reporting results of original research, although review articles and commentaries also were consulted. Abstracts of research presented at symposia and scientific conferences were not considered adequate for inclusion in this document. Guidelines published by organizations or institutions such as the National Institutes of Health and the American College of Obstetricians and Gynecologists were reviewed, and additional studies were located by reviewing bibliographies of identified articles.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Studies were reviewed and evaluated for quality according to the method outlined by the U.S. Preventive Services Task Force:

I: Evidence obtained from at least one properly designed randomized controlled trial.

II-1: Evidence obtained from well-designed controlled trials without randomization.

II-2: Evidence obtained from well-designed cohort or case–control analytic studies, preferably from more than one center or research group.

II-3: Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments also could be regarded as this type of evidence.

III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Analysis of available evidence was given priority in formulating recommendations. When reliable research was not available, expert opinions from obstetrician–gynecologists were used. See also the "Rating Scheme for the Strength of Recommendations" field regarding Grade C recommendations.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Based on the highest level of evidence found in the data, recommendations are provided and graded according to the following categories:

Level A - Recommendations are based on good and consistent scientific evidence.

Level B - Recommendations are based on limited or inconsistent scientific evidence.

Level C - Recommendations are based primarily on consensus and expert opinion.

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Practice Bulletins are validated by two internal clinical review panels composed of practicing obstetrician-gynecologists generalists and sub-specialists. The final guidelines are also reviewed and approved by the American College of Obstetricians and Gynecologists (ACOG) Executive Board.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The grades of evidence (**I-III**) and levels of recommendations (**A-C**) are defined at the end of the "Major Recommendations" field.

The following recommendations and conclusions are based on good and consistent scientific evidence (Level A):

- The false-positive rate of electronic fetal monitoring (EFM) for predicting cerebral palsy is high, at greater than 99%.
- The use of EFM is associated with an increased rate of both vacuum and forceps operative vaginal delivery, and cesarean delivery for abnormal fetal heart rate (FHR) patterns or acidosis or both.
- When the FHR tracing includes recurrent variable decelerations, amnioinfusion to relieve umbilical cord compression should be considered.
- Pulse oximetry has not been demonstrated to be a clinically useful test in evaluating fetal status.

The following conclusions are based on limited or inconsistent scientific evidence (Level B):

- There is high interobserver and intraobserver variability in interpretation of FHR tracing.
- Reinterpretation of the FHR tracing, especially if the neonatal outcome is known, may not be reliable.
- The use of EFM does not result in a reduction of cerebral palsy.

The following recommendations are based on expert opinion (Level C):

- A three-tiered system for the categorization of FHR patterns is recommended.
- The labor of women with high-risk conditions should be monitored with continuous FHR monitoring.
- The terms hyperstimulation and hypercontractility should be abandoned.

Definitions:

Grades of Evidence

I: Evidence obtained from at least one properly designed randomized controlled trial.

II-1: Evidence obtained from well-designed controlled trials without randomization.

II-2: Evidence obtained from well-designed cohort or case–control analytic studies, preferably from more than one center or research group.

II-3: Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments also could be regarded as this type of evidence.

III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

Levels of Recommendations

Level A - Recommendations are based on good and consistent scientific evidence.

Level B - Recommendations are based on limited or inconsistent scientific evidence.

Level C - Recommendations are based primarily on consensus and expert opinion.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate intrapartum fetal heart rate monitoring and management

POTENTIAL HARMS

Unnecessary cesarean or operative vaginal deliveries

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

These guidelines should not be construed as dictating an exclusive course of treatment or procedure. Variations in practice may be warranted based on the needs of the individual patient, resources, and limitations unique to the institution or type of practice.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Foreign Language Translations
Patient Resources

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2005 Dec (revised 2009 Jul)

GUIDELINE DEVELOPER(S)

American College of Obstetricians and Gynecologists - Medical Specialty Society

SOURCE(S) OF FUNDING

American College of Obstetricians and Gynecologists (ACOG)

GUIDELINE COMMITTEE

American College of Obstetricians and Gynecologists (ACOG) Committee on Practice Bulletins-Obstetrics

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

American College of Obstetricians and Gynecologists (ACOG) committees are created or abolished and their overall function defined by the Executive Board. Appointments are made for one year, with the understanding that such appointment may be continued for a total of three years. The majority of committee members are Fellows, but Junior Fellows also are eligible for appointment. Some committees may have representatives from other organizations when this is particularly appropriate to committee activities. The president elect appoints committee members annually.

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

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GUIDELINE AVAILABILITY

Electronic copies: None available

Print copies: Available for purchase from the American College of Obstetricians and Gynecologists (ACOG) Distribution Center, PO Box 4500, Kearneysville, WV 25430-4500; telephone, 800-762-2264, ext. 192; e-mail: sales@acog.org. The ACOG Bookstore is available online at the ACOG Web site.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

The following is available:

- Fetal heart rate monitoring during labor. Atlanta (GA): American College of Obstetricians and Gynecologists (ACOG); 2001.

Available from the American College of Obstetricians and Gynecologists (ACOG) Web site. Copies are also available in Spanish.

Print copies: Available for purchase from the American College of Obstetricians and Gynecologists (ACOG) Distribution Center, PO Box 4500, Kearneysville, WV 25430-4500; telephone, 800-762-2264, ext. 192; e-mail: sales@acog.org. The ACOG Bookstore is available online at the ACOG Web site.

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NGC STATUS

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